

WHAT IS CLAIMED IS:

1. An RF tag comprising a programmable miniature transceiver capable of communicating with a plurality of different platforms which operates by interrogating said tag with a predetermined waveform and receiving a waveform transmitted by said tag to said platform with tag generated information embedded therein.
2. The RF tag of Claim 1, wherein said transceiver includes a digital signal processing convolver for convolving a digital representation of the waveform transmitted to said tag with information to be embedded in the signal returned by said transceiver to the platform with which said transceiver is communicating.
3. The RF tag of Claim 2, wherein said information is encoded in a bi-phase pseudo random code modulation.
4. The RF tag of Claim 2, wherein said convolver includes a unit for direct up/down digital conversion of the waveforms transmitted and received respectively by said tag.
5. The RF tag of Claim 2, wherein the information to be embedded in the signal returned by said transceiver includes a fast-time convolution modulator.
6. The RF tag of Claim 2, and further including a waveform characteristics detector coupled to the digital representation of the waveform transmitted to said tag and a processor preloaded with waveform characteristics coupled to said convolver such that said information

to be embedded is embedded into a waveform having characteristics matching those detected by said waveform characteristics detector.

7. The RF tag of Claim 3, wherein said unit for direct up/down digital conversion includes an analog-to-digital converter for sampling the waveform transmitted to said tag and further including a clock coupled to said analog-to-digital converter, said clock having a predetermined frequency much greater than the bandwidth of the waveform transmitted to said tag.

8. The RF tag of Claim 7, and further including a decimator coupled to said analog-to-digital converter for throwing away a predetermined number of samples therefrom.

9. The RF tag of Claim 8, wherein said convolver includes a fixed tap convolver, said decimator matching the output thereof to the taps on said fixed tap convolver, whereby a fixed tap convolver can be used regardless of the bandwidth of the waveform transmitted to said tag, thus to adapt said tag to a wide variety of platforms which generate interrogating waveforms.

10. The RF tag of Claim 9, wherein the samples thrown away by said decimator nonetheless result in a sampling rate of the remaining signal which is above the Nyquist rate for the waveform transmitted to said tag.

11. The RF tag of Claim 4, wherein said direct digital down conversion unit includes a track and hold unit and a clock coupled thereto, said track and hold unit having an input

coupled to the waveform transmitted to said tag, said track and hold unit following said last-mentioned waveform and hold the last value thereof at the end of a predetermined interval established by said clock, thus to directly down convert the frequency of the waveform transmitted to said tag.

12. The RF tag of Claim 11, wherein the clock frequency of said, clock is much greater than the bandwidth of the waveform transmitted to said tag.

13. The RF tag of Claim 11, wherein said direct up conversion unit includes a return-to-zero unit to track the waveform from said convolver for a short period of time and then to output zero for time in between.

14. The RF tag of Claim 13, wherein said return-to-zero unit is clocked at the same frequency as said track and hold unit, thus not to preserve the characteristics of the waveform from said platform.

15. The RF tag of Claim 13, wherein the waveform transmitted to said tag is in the microwave region of the electromagnetic spectrum, and further including a band pass filter for passing only microwave signals, thus to effectuate direct up conversion of the signal from said convolver.

16. The RF tag of Claim 2, wherein said tag is placed on an individual said tag including a geopositioning receiver for indicating the position of said individual, said position being embedded into the waveform transmitted back to said platform.

17. The RF tag of Claim 16, wherein the amplitude of the waveform transmitted back to said platform is limited to just that above which said platform can receive, whereby, overt operation is established.
18. The RF tag of Claim 2, wherein no RF oscillators are used in said tag due to the use of said direct digital up/down conversion, whereby said tag can be used for covert operations.
19. The RF tag of Claim 1, wherein said tag functions as a router.
20. The RF tag of Claim 16, wherein said tag functions as a search and rescue transponder, wherein said information embedded in the transmission back to said platform includes tag location.
21. An RF tag comprising a programmable miniature transceiver capable of communicating with a plurality of different platforms which operates by interrogating said tag with a predetermined waveform and receiving a waveform transmitted by said tag to said platform with tag generated information embedded therein, said transceiver including a digital signal processing convolver for convolving a digital representation of the waveform transmitted to said tag with information to be embedded in the signal returned by said transceiver to the platform with which said transceiver is communicating, wherein said information is encoded in a bi-phase pseudo random code modulation, and said convolver includes a unit for direct up/down digital conversion of the waveforms transmitted and received respectively by said tag.

22. An RF tag comprising a programmable miniature transceiver capable of communicating with a plurality of different platforms which operates by interrogating said tag with a predetermined waveform and receiving a waveform transmitted by said tag to said platform with tag generated information embedded therein, said transceiver including a digital signal processing convolver for convolving a digital representation of the waveform transmitted to said tag with information to be embedded in the signal returned by said transceiver to the platform with which said transceiver is communicating, wherein said information is encoded in a bi-phase pseudo random code modulation, and said convolver includes a unit for direct up/down digital conversion of the waveforms transmitted and received respectively by said tag, and the information to be embedded in the signal returned by said transceiver includes a fast-time convolution modulator.